

19. Describe synthesis of Semiconductor nano particles CdS, PbS and GaP nano structures. Mention their applications.
20. Give the principle, instrumentation and applications of Transmission Electron Microscopy (TEM).

NOVEMBER/DECEMBER 2023

**23PECH13B — NANOMATERIALS AND
NANO TECHNOLOGY**

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.



1. Define Nanotechnology.
2. What are zero dimensional materials? Give an example.
3. Define crystal structure.
4. What do you mean by electrochemical method?
5. Outline anyone synthetic methods to prepare gold nanoparticles.
6. Mention the properties of iron oxide nanoparticles.
7. Write a note on the electronic properties of nano materials.
8. Give a preparation of nano CdS.

9. Enlist the applications of polymer-matrix composites.
10. List the differences between AFM and SEM.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Discuss the classification of nanomaterials based on their dimensions.

Or

- (b) Enumerate the Bottom-Up and Top-Down approaches in nanoparticle synthesis.

12. (a) Outline the various steps in plasma synthesis of nanomaterials.

Or

- (b) Explain the sol-gel method of synthesis of nanoparticles.

13. (a) Mention the thermal properties of nanomaterials.

Or

- (b) Justify silicon as substrate material and mention its mechanical properties.

14. (a) Explain in detail Electrical, magnetic and mechanical properties of nanostructured materials.

Or

- (b) How will you synthesis nanosized semiconductor?

15. (a) Write different types of nanocomposite materials with example.

Or

- (b) What is the purpose of SEM? Explain its principle and applications.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. List out applications of Nano materials and neatly explain them.
17. What is chemical vapour deposition (CVD) technique for thin film preparation? What are different CVD techniques? State some uses of CVD.
18. Sketch the preparation of alumina nano particles and enlist their properties.

